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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,713	10/20/2006	Martin Hausner	BEET-14	9725
26875 7590 11/10/2009 WOOD, HERRON & EVANS, LLP 2700 CAREW TOWER 441 VINE STREET CINCINNATI, OH 45202				
EXAMINER				
PHAM, THANH V				
ART UNIT		PAPER NUMBER		
2894				
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11/10/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/555,713

**Applicant(s)**

HAUSNER ET AL.

**Examiner**

THANH V. PHAM

**Art Unit**

2894

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 18-32 is/are pending in the application.
- 4a) Of the above claim(s) 30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-29, 31 and 32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 November 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date 10/09 and 11/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election without traverse of Group I (claims 18-29 and 31-32) in the reply filed on 03/02/2009 is acknowledged.

***Drawings***

2. Figure 11 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (applicant admitted this "typical" figure is "known" in instant specification page 1 lines 14-17). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
4. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

5. The disclosure is objected to because of the following informalities: at least in page 1, after the title, “waver” on line 3, should be --wafer--; “104” on line 20 should be --114--; “105” on line 22 should be --115--; “101a” on line 25 should be --111a--.

Appropriate correction is required.

***Claim Objections***

6. The dependencies of claims 25-29 and 31-32 are not acceptable.

Claims 25-29 and 31-32 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim *should refer to other claims in the alternative only, and/or, cannot depend from any other multiple dependent claim.*

MPEP§ 608.01(n).

Accordingly, the claims have not been further treated on the merits.

It is suggested that the term “according to one or more of” in claims 25-26 and 28 being changed to --as in any ~~according to one or more of~~-- then claims 27, 29 and 31-32 would be alright.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 19 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 depends on claim 18 wherein claim 18 recites “the support has a round or oval contour”. Claim 19 redefines “the support has a rectangular and particularly a

square contour". The support cannot be both round or oval and rectangular or square. If desired, claim 19 should be rewritten to be an independent.

Claim 25 recites "the blanks" which lacks antecedent basis. It is assumed that "the blank" is the cavity.

***Claim Rejections - 35 USC § 102 and § 103***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 18-27 are rejected under 35 U.S.C. 102(a) as anticipated by applicant's admitted prior art or, in the alternative, under 35 U.S.C. 103(a) as obvious over applicant's admitted prior art in combination with Schiller WO 01/000523 A1 (provided by applicant), Tomonari et al. EP 0 599 364 A2 (provided by applicant) and US Pub. 2003/0118076 A1 (herein after '076) and/or US 6,294,787 B1 (herein after '787), both, to Schieferdecker et al.

Re claims 18-19, the applicant's admitted prior art discloses substantially all of the claimed invention but the shape of the cavity with the round or oval (re claim 18), rectangular (and particularly square) contour support (re claim 19).

The Schiller reference discloses on page 14 that "the shape of the void 170 is such that no proof mass is retained", "the conductive layers 252a and 252b are preferably configured to efficiently excite the fundamental vibration mode of the diaphragm layer 240 suspended over the void 270".

The Tomonari et al. reference discloses in fig. 59 rounded corner or circular cavity; (fig. 63 with an unnamed element on top of element 18R could be considered as lens or mirror).

The Schieferdecker et al. references disclose different shapes of the cavity in forming sensor.

To employ different shapes for the void /cavity in the structure of sensor would have been obvious to one of ordinary skill in the sensor formation art as the different shape would be selected in accordance with the sensor as taught by Schiller and Tomonari et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the sensor structure with different shapes as taught by Schieferdecker et al. The use of different shapes for the cavity is well known to those skilled in the art as taught by Schieferdecker et al.

Re claim 20, in the combination, a radiation sensor according to claim 19, characterized in that one or more electric terminals are provided in a corner section of the sensor (applicant's admitted prior art's 115a, 115b; Schieferdecker et al. '076, fig. 7/55,57, e.g.).

Re claim 21, in the combination, a radiation sensor according to claim **18**, characterized in that the sensor element is a thermopile (Schieferdecker et al. '076, [0052], e.g.).

Re claim 22, in the combination, a radiation sensor according to claim **18**, characterized in that a plurality of sensor elements are formed above one cavity (Schieferdecker et al. '076, fig. 8 or '787, figs. 2-3 and 5, e.g.).

Re claim 23, in the combination, a radiation sensor according to claim **18**, characterized by one or more of the following features:

the membrane material comprises a dielectric, particularly silica and/or silicon nitride (Schieferdecker et al. '787, figs. 2-3/51; '076, fig. 9/111, e.g.);

under the membrane an etching stop layer containing an oxide, particularly silica, is provided (Schieferdecker et al. '076, fig. 9/113,14, [0051], e.g.); and

the support material contains silicon and/or GaAs and/or a semiconductor material (Schieferdecker et al. '076, [0060], e.g.).

Re claim 24, in the combination, a radiation sensor according to claim **18**, disclose following dimensions:

support height H: more than 50  $\mu\text{m}$ , preferably more than 200  $\mu\text{m}$ , less than 1,500  $\mu\text{m}$ , preferably less than 600  $\mu\text{m}$  (Schieferdecker et al. '076, [0024]; '787, col. 5, line 38, e.g.);

support edge length L: less than 2 mm, preferably less than 1.5 mm (Schieferdecker et al. '076, [0008]; '787, col. 6, lines 10-13, e.g.);

cavity diameter D: more than 55%, preferably more than 65% and/or less than 90%, preferably less than 80% of the support edge length (Schieferdecker et al. '076, [0025], e.g.); and

membrane thickness D: less than 3  $\mu\text{m}$ , preferably more than 0.1  $\mu\text{m}$  (could be made in accordance with the provided dimensions).

Re claim 25, in the combination, a wafer comprising a plurality of ~~blanks~~ cavities for radiation sensors as in any ~~according to one or more~~ of the preceding claims formed on it, characterized in that the ~~blanks~~ cavities are arranged on the wafer in a rectangular, rhombic, triangular or hexagonal grid (Schieferdecker et al. '787, col. 4, lines 15-28, e.g.).

Re claim 26, in the combination, a sensor array comprising a plurality of radiation sensors according to one ~~or more~~ of claims **18** to **24** (Schieferdecker et al. '787, col. 4, lines 15-28, e.g.).

Re claim 27, in the combination, a sensor array according to claim 26, characterized in that a plurality of radiation sensors are arranged in two or more rows and in two or more columns (Schieferdecker et al. '787, col. 4, lines 15-28, e.g.).

12. Claims 28-29 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over the above combination as applied to claims 18-27 above, and further in view of Fujikawa et al. US 6,548,813 B1

In the combination, a sensor module comprising: a radiation sensor according to one ~~or more~~ of claims 18 to 24;

The combination does not clearly disclose:



a housing in which the radiation sensor is accommodated;  
an optical window in the housing;  
electric terminals protruding from the housing, said electric terminals being connected to the terminals; and  
an optical projection element, particularly a lens or a mirror

(In addition to instant specification's page 9 that "standard housing" has a radiation window), the Fujikawa et al. reference discloses this window and the conductor as electric terminals protruding from the housing and an optical projection element, particularly a lens or a mirror.

Because it is known as standard, one of ordinary skill in the art at the time of the invention to provide the structure of the combination with known art housing with window and electric terminals protrudes from the housing.

### ***Conclusion***

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to THANH V. PHAM whose telephone number is (571)272-1866. The examiner can normally be reached on M-T (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly D. Nguyen can be reached on 571-272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/THANH V. PHAM/  
Primary Examiner, Art Unit 2894